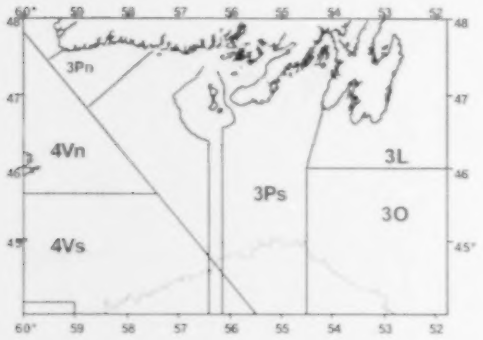

American plaice in Subdivision 3Ps

Background

American plaice, which occurs on both sides of the North Atlantic, is a bottom dwelling flatfish. In the western Atlantic, the species ranges from U.S.A. waters to the Arctic, with the largest population occurring on the Grand Bank off Newfoundland. American plaice are found over a wide range of depths and temperatures.

Female American plaice in 3Ps mature at about age 9 and 36 cm while male plaice mature at about age 4 and 16 cm. This is a relatively slow growing species with fish not reaching 40 cm until nearly age 10.

Catches from this stock were highest from 1968 to 1973, during which time they averaged over 10000 t. Since 1980, catches have exceeded 5000 t only twice. Through the 1980's the majority of this fishery occurred in the offshore. Both offshore and inshore catch declined substantially in the early 1990's and since 1995 the offshore catch has constituted less than 50% of the total. The stock has been under moratorium since September 1993.

Summary

- This stock has been under moratorium since September of 1993.
- Since 1992 stock size has been very low.
- There has been a slight increase since 1993 in both biomass and abundance indices but current biomass is only 16% and abundance 21% of the 1983-87 average.
- Since 1993, female SSB calculated from the Campelen series has been only 15% of the 1986-87 average.
- Analyses of recruitment from survey data indicated that the 1977 and 1978 year classes were strong but that there were no good year classes between 1980 and 1992.
- Given the current low stock size and the lack of recruitment indicated by the surveys and the slow growing nature of American plaice there is little prospect of significant rebuilding in the short to medium term.

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Species biology

Growth as measured by mean length at age in research vessel surveys has increased in recent years for both males and females (Figure 1). Mean weight at age has shown a similar increasing trend over the 1990-98 time period.

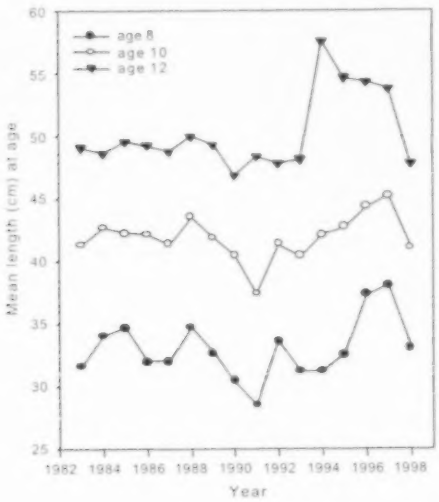

Figure 1. Mean length at age of female American plaice from research vessel surveys.

Males mature substantially younger and smaller than female American plaice. **Age at maturity** for both males and females has shown little trend since 1983. However an earlier study showed that there had been a decline since the early 1970's. Currently the age at 50% maturity is 9 for females and 4 for males. **Length at maturity** has also shown a decline since the early 1970's. For males length at 50% maturity has declined from 29 cm to 16 cm and for females it has declined from 41 cm to 36 cm (Figure 2).

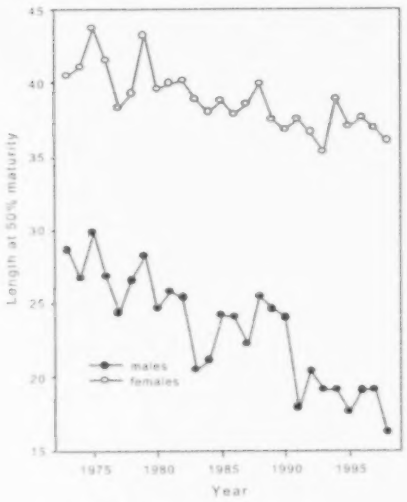

Figure 2. Length at 50% maturity for male and female American plaice.

Distribution of American plaice in 3Ps has changed in recent years. Up until the late 1980's most American plaice were found on the central and eastern portions of St. Pierre Bank. Since then most fish have been found in warmer, deeper waters of the southeastern slope of the bank.

The Fishery

Catches from this stock were highest from 1968 to 1973, exceeding 12,000 t on three occasions in this period (Figure 3). Catches by non-Canadian vessels peaked at about 8800 t in 1968, due mainly to the USSR catch, and have not exceeded 800 t since 1973. Since 1977 only Canada and France have been involved in this fishery. Catches averaged just under 4000 t during the 1980's but rapidly declined after 1991. Based on a recommendation by the FRCC the fishery was closed in September of 1993 for the remainder of that year. There has been no directed fishing since that time and catch has not exceeded 500

t. The catch in 1998 was 423 t and the catch as of October 8, 1999 was 475 t.

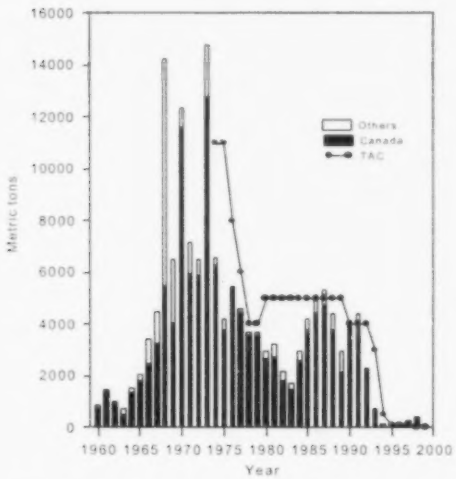

Figure 3. Reported catch and Total Allowable Catch for American plaice in 3Ps.

There have been substantial changes in this fishery over time. Throughout most of its history the majority of this fishery occurred in the offshore but since 1995 the offshore catch has constituted less than 50% of the total. The percentage of large fish taken in the fishery has declined.

Industry perspective

There are reports of increased abundance in American plaice on Burgeo Bank and in the inshore in 1999.

Resource Status

Based on research vessel surveys both biomass and abundance were variable from 1973-83 with perhaps a slight increasing trend (Figure 4). From the mid 1980's to 1990 there was a large decline in the indices. Since 1992 stock size has been very low. There has been a slight increase since 1993 in both biomass and abundance indices but current biomass is only 16% and abundance 21% of the 1983-87 average. Abundance at all ages is low compared to the mid 1980's. A new survey in 1998 sponsored by the Groundfish Enterprise Allocation Council (GEAC) showed similar results.

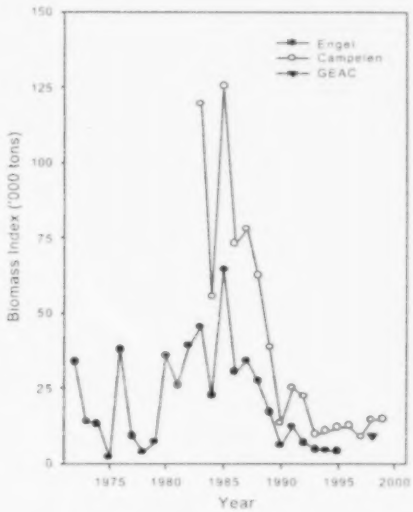

Figure 4. Biomass index of American plaice from research vessel surveys from 1972-95 (Engel) and 1983-99 (Campelen) as well as an industry sponsored survey (GEAC) in 1998. Campelen data from 1983-95 are converted from the Engel data.

Estimates of total mortality from survey data increased from the mid 1980's to the early to mid 1990's. Total mortality remained high in 1994 and 1995 following the imposition of the moratorium despite low catches. This may indicate an increase in natural mortality over that time period. Estimates of total mortality have declined since.

A **female spawning stock biomass index** was calculated from survey information (Figure 5). SSB showed an increase from the mid

1970's to mid 1980's followed by a precipitous decline. This rapid decline is seen in both the original Engel and the Campelen equivalent time series. Since 1993, SSB calculated from the Campelen series has been only 15% of the 1986-87 average.

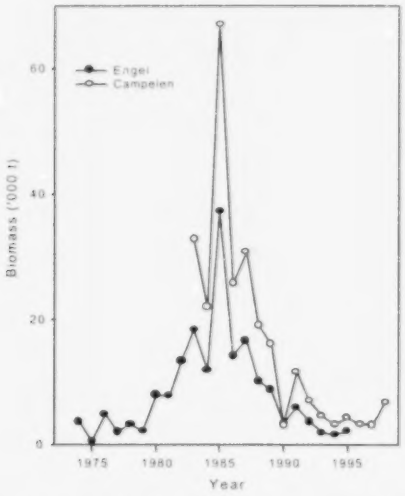

Figure 5. Female spawning stock biomass index of American plaice from research vessel surveys for Engel and Campelen data. The Campelen data from 1983-95 are converted from the Engel series.

Analyses of **recruitment** from survey data indicated that the 1977 and 1978 year classes were strong and that the 1994 year class may be above average (Figure 6). However, there were no significant differences between cohorts in the analyses of the Campelen data from which the 1994 estimate was produced. There were no good year classes between 1980 and 1992.

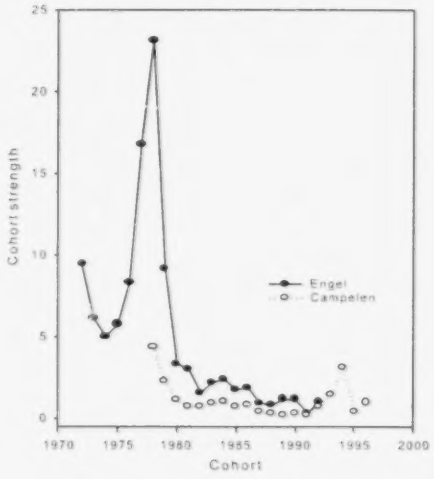

Figure 6. Estimates of recruitment (cohort strength) of American plaice from research vessel surveys using Engel and Campelen data. The Campelen data from 1983-95 are converted from the Engel series.

Catch to research vessel biomass ratios, used as an index of exploitation rate, were relatively high from 1990-92 and declined after to low levels, generally below those of the 1980's.

Sources of uncertainty

This assessment is based solely on analyses of survey indices and trends in catch. There has been insufficient sampling of the commercial catch since 1993 to construct a catch at age. This means that it has not been possible to explore the use of age structured models to estimate total population size. A stock production model was explored but there was too much uncertainty in the results for them to be considered useful.

Outlook

Despite the inability to calculate fishing mortality and total stock size, given the current low stock

size and the lack of recruitment indicated by the surveys and the slow growing nature of American plaice there is little prospect of significant rebuilding in the short to medium term.

Management Considerations

Since the imposition of the moratorium catch of American plaice has consisted of bycatch from other fisheries. With the removal of the TAC as recommended by the FRCC, landings of American plaice will increase as landings of other species increase. With restrictions on bycatch of American plaice in Conservation Harvesting Plans there is a potential for substantial discarding such that landings may significantly underestimate catch. These two factors will result in an increase in fishing mortality.

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